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THE PRESENT POSITION

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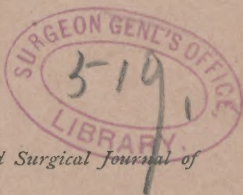
**ELECTROLYSIS IN THE TREATMENT
OF CUTANEOUS AFFECTIONS.**

BY

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THE PRESENT POSITION OF ELECTROLYSIS IN THE TREATMENT OF CUTANEOUS AFFECTIONS.¹

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It is not my intention in this paper to discuss exhaustively the subject that I have chosen; but I have thought that it might be of interest to the Society to enumerate briefly the various skin affections to which electrolysis has been applied, and to record my own experience as it stands to-day in the application of this method.

That the resources of dermatology have been materially strengthened by the introduction of electrolysis, there can be no doubt. It is the only safe and effective means for the destruction of hair, and its range of application in other affections may be reasonably regarded as likely to be widened by a perfection of the details necessary for success under varying conditions. Electrolysis has been accorded but scant recognition in Europe, until within the last few years, and even now it would appear that many fail to appreciate the value of its employment in various conditions, when in the hands of experienced operators. The last edition of Kaposi's text-book contains for the first time a description of the operation of electrolysis for the removal of hair, although but little mention is made of its applicability to other conditions. In Paris it has at last attained a secure position, chiefly owing to the initiative of Brocq, whose experience will be referred to later.

¹ Read before the Boston Society for Medical Improvement, March 28, 1892.



DESTRUCTION OF HAIR BY ELECTROLYSIS.

It is now fourteen years since Hardaway first employed the electric needle for the destruction of the hair and its papilla, and it remains the only safe and permanent cure for hypertrichosis. It has been proved, over and over again, that every hair can be permanently destroyed, granting a liberal supply of time and patience; and failure to succeed can only depend upon an improper performance or lack of experience. While the operation may appear at first glance in the light of a cosmetic refinement simply, any one who has had considerable experience with the subjects who present themselves for treatment will be eager to testify that it is something more. It is almost impossible to exaggerate the mental suffering occasioned in some women of highly sensitive temperament by the presence of a growth of hair upon the face. It is constantly in their thoughts, and in many instances produces so great a degree of sensitiveness, that their health becomes impaired by the degree of seclusion to which they condemn themselves.

The operation has so often been described that I shall content myself with alluding to one or two points that seem to me worthy of emphasis.

In the first place, I do not see how it is possible to lay down any exact rules for this procedure. Its proper performance is attained by practice only, and the indications that govern us at a given moment are only to be defined in the broadest possible way. I am convinced that two operators may do the work equally well, while using methods quite dissimilar in their details.

I should be very loath to say how long the current should be allowed to pass, or how strong the current should be, as it varies so widely, according to the part

of the face operated upon, the size of the hair and the sensitiveness of the skin. I have never found it necessary to exceed two milliampères, and rarely to use more than one and one-half milliampères. A galvanometer is to me an aid, and I am in the habit of keeping one constantly in the circuit; but I consider it of very trifling importance compared with the aptitude acquired by experience, and am far from regarding it as necessary for the best work. In some cases it is of very little use to me; in others, especially where there are very stout hairs to be removed that require a relatively strong current, I have thought that it aided me quite sensibly. For a beginner it seems to me a most proper instrument, as much loose work has undoubtedly been done by the inexperienced, and the use of a galvanometer may, in part, supply the place of the judgment acquired by experience. I have tried a battery of high electro-motive force, with a strong resistance in the circuit, as has been recommended, but have abandoned it after a thorough trial. There is a certain amount of shock experienced by the patient, which is not felt when a small electro-motive force is used, and practically I could see no advantage from the greater steadiness of the current.

I am in the habit of using a copper electrode, covered with absorbent cotton. This is either held constantly in the patient's hand, or they are directed to make and break the current after the insertion of the needle. The latter procedure I have found advisable when hairs that are very stout, or in close proximity, are to be destroyed, as a certain amount of unnecessary inflammation may be caused by the needle in trying to find the mouth of the follicle; but in cases where the hairs are far apart and the follicular mouths easily found, it will save time if the electrode be kept constantly in contact with the skin, although the pain

is rather added to, the shock being greater when the circuit is broken by the withdrawal of the needle.

With regard to possible marks left by the operation, they are very slight, and I have never caused any that would be noticeable, or were objected to by the patient, so far as I know. In the large majority of cases, the hair may be destroyed without leaving the slightest evidence of the operation. It is my impression that it is better, provided that the necessary patience is granted by the subject, to allow a larger number of hairs to return than is really necessary; for it is often difficult, even after much experience, to determine the exact moment when a given hair has been destroyed. It is better, therefore, to stop before that point has been reached and to remove it at a subsequent sitting, than to run the risk of causing too much destruction of the tissues around. But every dermatologist knows that idiosyncrasy plays its part in scarring, as well as in other pathological conditions. We know, for instance, that in some skins, an acne pustule will leave an indelible mark, while in most others a much greater degree of follicular inflammation will, on subsiding, leave the skin perfectly smooth, and this is true, also, of slight injuries. The negro skin is proverbially disposed to keloidal growths after injuries or inflammation, from some as yet obscure cause. For this reason we may expect in rare instances to encounter subjects whose skin re-acts more vigorously than usual to the violence done by the electric needle, and in them, even with the utmost caution, a slight pitting may result.

The hairs upon the neck are hardest of all to remove, on account of the angle at which they are inserted, and one usually has a larger number of recurrences here than in most localities. It would appear that we must expect a certain small number of hairs to return,

requiring a second treatment, even if the operation is most carefully performed. That this is inevitable may be seen from what takes place in the formation of new hair. It is agreed by all who have studied the subject, that the new hair is formed at the lower part of the follicle, before the old hair has become freed from its epithelial connections and cast off. Unna even asserts that the old hair continues to grow for a certain time after the papilla has disappeared and the root has become contracted, obtaining its nourishment through the rete cells of the walls of the follicle to which it adheres. But whether or not this view be the correct one, it will be seen that many of the old hairs not yet detached must be among those that we remove, and that in the same follicle, at a point not likely to be reached by our needle, lie the elements of a new hair which will make its appearance later.

The number of hairs that can be removed at a sitting varies so widely that it is practically impossible to formulate any rule; and, therefore, one should be very cautious in replying to the inevitable question, How many sittings will be necessary? But it can be said decidedly that every hair can be thoroughly destroyed in the end, and that a successful result in every case is simply a matter of time and patience.

Turning now to the other cutaneous conditions to which electrolysis is applicable, we find ourselves dealing chiefly with hypertrophies and new growths, — affections in which we are able to make use of the destructive action caused by the electric needle in a limited area.

DILATED AND HYPERTROPHIED BLOOD-VESSELS.

In this class of cases electrolysis is now a therapeutic agent of distinct importance, although the hopes that were at first aroused have not been wholly real-

ized. The small, punctate, angiomatous spots with radiating offshoots of dilated blood-vessels, the so-called "spider cancers," are readily and effectively cured by inserting a needle of a size suited to the individual lesion into the very centre of the growth, and allowing a current, usually somewhat stronger than that employed in hypertrichosis, to pass for a few seconds. A blanching of the dilated capillaries is immediately seen, beginning at the point where the needle has entered the skin, and extending peripherally until the minute radiating vessels have ceased to be apparent to the eye. If cautiously done, no trace of the operation should be left; the pain is trifling, and is easily borne in many cases by quite young children. It may rarely be necessary to reinsert the needle at a subsequent sitting, if, owing to an especially sensitive skin, or any other reason, it has been thought wise to begin with a very feeble current and to proceed cautiously. At the point of insertion of the needle, a small crust may form, which is allowed to fall of itself, leaving a smooth, normal surface.

In another class of cases, somewhat similar to those just spoken of — small angiomata, from the size of a pin's head to that of a small pea, — a similar procedure is often effective. If the lesion is raised above the level of the surrounding skin, it may be removed by passing the needle through its base in different places, allowing the current to pass but a short time at either insertion. Here, again, as in hypertrichosis, it is impossible to lay down definite rules for guidance. A certain measure of experience will prove of the greatest value in determining the results attained. Some have recommended the insertion of two needles, one connected with either pole of the battery, into these growths when they are of the size of a small pea; but of this method I have no experience. I have always

used a needle attached to the negative pole of the battery, and in the case of small, isolated angiomas, the results have almost always been satisfactory. With regard to the larger angiomas, in which are included the vascular naevi that often attain a large size in infants, their treatment falls more properly into the province of the surgeon.

Telangiectasis, a more or less diffuse dilatation of the superficial blood-vessels; and under this head I shall include rosacea. It was Hardaway, the introducer of electrolysis for hypertrichosis, who first suggested this method for obliterating dilated blood-vessels in the skin. He introduced a needle attached to the negative pole, either perpendicularly or parallel to the vessel to be destroyed, allowing the current to pass a longer or shorter time, according to the size of the vessel and other indications. As to the permanent effect of this procedure, or its applicability to all cases, Hardaway's experience had not at the time been sufficient to warrant positive assertions. Since that time the method has been widely tried, especially in America, our previous control of this condition not being sufficiently satisfactory to warrant us in rejecting any method that looked promising.

From my own experience, I should not wish to exalt this method to the exclusion of all others in the treatment of the different grades of rosacea, although I should be very sorry to be deprived of its aid. In the milder form, where the redness is equally distributed over the affected surface, and where the individual vessels are with difficulty, or not at all perceptible, when the skin is put upon the stretch, electrolysis has proved of very varying advantage. In many cases no permanent result could be obtained, although I have tried many different ways of inserting the needle, and variations of detail. The collateral circulation is apt

to be so complete that it is simply impossible to destroy enough of the minute, invisible branches to prevent the blood-supply from returning, sooner or later, to the neighborhood of its former seat. In other cases of this class, a number of trials at intervals of a week have served to modify so completely the annoying conditions that much satisfaction has been expressed by the patient. In obstinate cases, where a strong desire for relief is expressed, the method seems to me worthy of a careful trial with a guarded prognosis; and on the whole, my experience has not been such as to discourage the hope that it may be capable of still further development,

Cases of diffuse redness, where a few of the smaller vessels stand out prominently, are much more amenable to treatment, although even here I have been sometimes disappointed. As a rule, the more prominent vessels may be made to disappear by inserting the needle in several parts of their course, and in this manner the affection may become much less pronounced.

The severer grades of rosacea, complicated usually with acne, are proper subjects for this treatment, and may often be permanently benefited. The reserve that has been expressed with regard to the treatment of the milder forms must, however, be repeated here. Many cases are somewhat improved, some greatly, and a considerable number prove refractory. My experience with the severer cases has not been so large as with those of medium grade, and I am not, therefore, inclined to express myself categorically at the present time.

Port-wine Mark. — The treatment of this disfiguring congenital condition has been the subject of much ingenious experimentation, and various methods, such as that of multiple scarification, introduced by Bal-

manno Squire, have offered hope from time to time. The introduction of electrolysis for the removal of hair was soon followed, as has been seen, by its application to other cutaneous blemishes; and Drs. Hardaway and Fox were the first, I believe, to recommend its use in the treatment of *nævus vasculosus*. Dr. Hardaway employed first a bundle of needles, but found that the reaction after their use was too violent, and that there was a great tendency to keloidal development; so that he later employed the single needle. At a meeting of the American Dermatological Association, held in 1885, Dr. J. C. White reported that although he could not state that he had produced a complete cure, great improvement had taken place in a number of cases, and in some diseased patches complete obliteration of the vessels had resulted.

My own experimentation has been with the single needle solely, and the results in a limited number of cases have not been on the whole satisfactory. An improvement was often to be seen that did not prove to be permanent. In cases where isolated vessels or irregularities of surface are present, the appearance of the whole may be much improved by destroying these excrescences. But in this condition we have, as a rule, to deal with a very dense anastomosis of vessels of a small calibre, which are so closely intertwined that the separate vessels cannot be seen, and which is often connected with a dilatation of the deeper plexus as well. Dr. G. H. Fox, of New York, has proposed to create numerous minute cicatrices upon the surface of the patch with the electric needle, by which means the color would be so reduced that there would be no contrast with the surrounding skin, while the usual appearance of scar tissue would not be produced. Dr. Fox, in a recent letter to the writer, says: "I have

succeeded in removing a few small wine marks both by electrolysis and by 'spotting' with nitric acid, that is to say, making yellow dots as close to one another as possible without coalescing. The result has been a smooth, semi-cicatricial condition of the skin, with great satisfaction on the part of the patient. In extensive wine marks of the face, I have often removed the excrescences, changed the hue from dark purple to light pink, and in some cases have made a light, contrasting band directly across the patch; but these results have hardly been commensurate with the time and trouble involved. Still, I am more encouraged than I was years ago, when I first wrote on the subject, and have found nothing else that will do nearly so well."

HYPERTROPHIES OF FIBROUS TISSUE AND OF PIGMENT.

These conditions, often of congenital origin, are more safely treated by electrolysis than by any other method with which I am acquainted. The most frequent condition is that commonly described as a "mole," which is most thoroughly detested by women when occurring on a conspicuous part of the face. The blemish may be merely a congenital hypertrophy of pigment in a limited area, a pigmented spot with smooth surface (*nævus spilus*); or there may be in addition an increase of connective-tissue, causing the blemish to project more or less prominently above the level of the skin, and often covered with stout, wiry hairs.

When the "mole" consists merely of an hypertrophy of pigment, it may be safely and neatly removed by touching it a number of times with a rather stout needle, connected with the negative pole of the galvanic battery, taking care to go no deeper than the part of the tissue that contains the pigment granules.

A superficial crust will form, which is allowed to fall spontaneously, leaving a smooth, almost normal surface. If the growth is covered by hairs, it will be well to remove these first, and if many deeply-seated ones are present, they should not all be removed at once, so as to avoid the scarring that may result if hairs that are situated closely together are destroyed at the same sitting.

When there is hypertrophy of the fibrous tissue, causing an elevated lesion, as in the most disfiguring "moles," its base is transixed in various diameters by a rather stout needle, using the utmost care not to include the normal tissue, and not to insert the needle deeper than is necessary. If the base is somewhat constricted, the operation is all the more easy and satisfactory; but in almost all cases of this kind, where the lesion is of a small or moderate size, the best results may be obtained after a little experience. An important maxim, it seems to me, is not to attempt the removal of the whole excrescence at once, if the very best results are desired, but to stop just short of what you think will be sufficient destruction. After the process of repair is complete, the remaining portion may be accurately gauged, the difficulty being to determine the exact instant when the "mole" has been destroyed; as further destruction must be at the risk of getting a less satisfactory cosmetic result. In this way we may keep the amount of destruction under pretty accurate control, and for this reason the method is superior to that where acids and other caustics are used. In the treatment of some flat forms of fibrous hypertrophy I have made use of a needle with a lancet point, which may be moved in various directions through the growth. Hardaway has applied this method to the treatment of ordinary freckles also, treating them by repeated touching with the point of the needle, which should not enter deeply.

Very many verrucous lesions are also well adapted to this mode of destruction, the procedure being varied somewhat according to the individual indications. Small warts upon the face, for example, are treated in the same way as the fibrous hypertrophies just considered, and with good results. I do not wish, however, to claim for electrolysis an exclusive place in the therapeutics of these growths, as the judgment of the physician will, in many instances, lead him to prefer other methods.

Scleroderma. Circumscribed plaques and bands of scleroderma have been more or less successfully treated by electrolysis. Brocq reports several of these, in which he has used much the same methods as in keloid. He uses a single small, fine needle and a very feeble current, inserts the needle parallel to the surface of the skin, taking care not to include the neighboring tissue. He has noted that the electrolytic action may favorably affect a part of the growth situated at a distance from the point at which the needle is inserted. He regards the *method* of operating as being of great importance, to be varied according to the individual case.

NEW GROWTHS.

Keloid and Hypertrophied Scars.— The treatment of these lesions, so unsatisfactory as a whole, has not as yet been very much advanced by the employment of electrolysis, although some favorable results have been reported. Suggested as worthy of trial by Dr. Hardaway, the subject was discussed at the meeting of the American Dermatological Association, September, 1888, when Drs. Fox, Hyde and Heitzmann reported that in a small number of cases they had failed of success. Dr. Morrison reported some favorable results in hypertrophied scars. In a letter to the

Journal of Cutaneous and Genito-Urinary Diseases, dated February, 1889, Dr. Hardaway explained that he had in no sense urged its claims as a specific treatment for keloid. He had merely considered that some favorable results that he had obtained were worthy of record, and should stimulate to a further trial. Brocq, of Paris, who has been mentioned before as the one in France who has been most alive to the merits of electrolysis, has reported several good results from its use in keloid. He advises the employment of a current of from five to ten milliamperes for from thirty to forty seconds, the needle being introduced in various places until the whole growth has been influenced by the electrolytic action. The operation was repeated about once in ten days. He regards the good effects of the operation as continuing for some months after its performance, in contradistinction from scarification, where there is a tendency to recurrence as soon as the treatment is omitted, provided the whole growth is not destroyed. That he is not to be regarded as a very devout disciple of this procedure may be surmised from the fact that he recommends its combination with the older ones of scarification and of the application of mercurial plaster.

While the published results have thus far not been particularly encouraging, the obstinacy of these growths to excision and the other methods should be remembered, and the good effects occasionally observed from electrolysis accorded their full weight.

There are other small forms of new growths in which electrolysis may often be employed with advantage. It has been proposed to treat small epithelial formations in this way, or by combining electrolysis with curetting. For xanthoma, which grows so frequently upon the eyelids, electrolysis has been well spoken of and would seem a most promising method.

Apart from the fact that a smoother, less permanent cicatrix is usually left, it has the advantage of causing little pain and being entirely bloodless, and patients who fear the knife will often consent readily to the electric needle. I have never heard of, or seen the slightest harm following its use.

LUPUS.

Gärtner and Lustgarten published in 1886 a method for treating lupus, in which they destroyed the nodules by applying a silver plate, surrounded by a hard rubber ring and connected with the negative pole of a battery, to the diseased tissue. They used a current of from five to ten milliampères, and found that the lupus nodules, when scattered over the skin, were alone attacked, the sound tissue remaining undisturbed. A great advantage claimed for this method was its comparative painlessness. Dr. Jackson of New York reports good results from this method, as well as from the employment of the single needle. My own experience is very limited, confined to one pretty extended case of long standing, where there was much formation of fibrous tissue in the lupus nodules, rendering the treatment by nitrate of silver very difficult. A single large needle was used, either in its ordinary shape or bent over at the point, so as to afford a larger working surface. The pain caused was certainly much less than that from boring with the nitrate of silver stick, and I was quite well satisfied with the results. With the Gärtner-Lustgarten method I have had no experience. Since we have been rudely thrown back upon our old mechanical methods in treating cutaneous tuberculosis, anything that promises to be of service, even occasionally, should be welcomed. It is difficult to believe that electrolysis will ever supplant the other methods by cauterization and raclage, but I do not

doubt that occasionally, especially when the tissue is firmly organized, it may be resorted to with benefit. Where there has been ulceration, it would seem to be of less value. A very strong argument in its favor is the comparatively slight amount of pain caused, a point of the utmost importance where large surfaces have to be frequently treated.

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